

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

**THE 2007 INTERIM GUIDELINES,
CONTINGENCY PLANNING,
THE RISK STUDY,
DEMAND MANAGEMENT & WATER BANKING
HOW DO THEY ALL FIT TOGETHER?**

Colorado Water Congress
2016 Summer Conference and Membership Meeting
August 24, 2016

OUTLINE

- 1. 2007 INTERIM GUIDELINES - SETS RELEASES FROM POWELL TO LB**
- 2. CONTINGENCY PLANNING - UB & LB PLANS TO ADDRESS DROUGHT IN UB AND DROUGHT AND STRUCTURAL DEFICIT IN LB**
- 3. JOINT ROUNDTABEL RISK STUDY - CONSIDERING FREQUENCY & MAGNITUDE OF DEMAND MANAGEMENT ON THE UB & COLORADO**
- 4. WATER BANK WORK GROUP - LOOKING AT ONE OF THE TOOLS THAT MIGHT BE USED TO IMPLEMENT DEMAND MANAGEMENT**
 - A. SCA “PILOT PROJECTS” – FUNDING PILOT PROJECTS TO STUDY HOW CONSUMPTIVE USES IN ALL SECTORS (NOT JUST AG) MIGHT BE REDUCED**



2007 INTERIM GUIDELINES

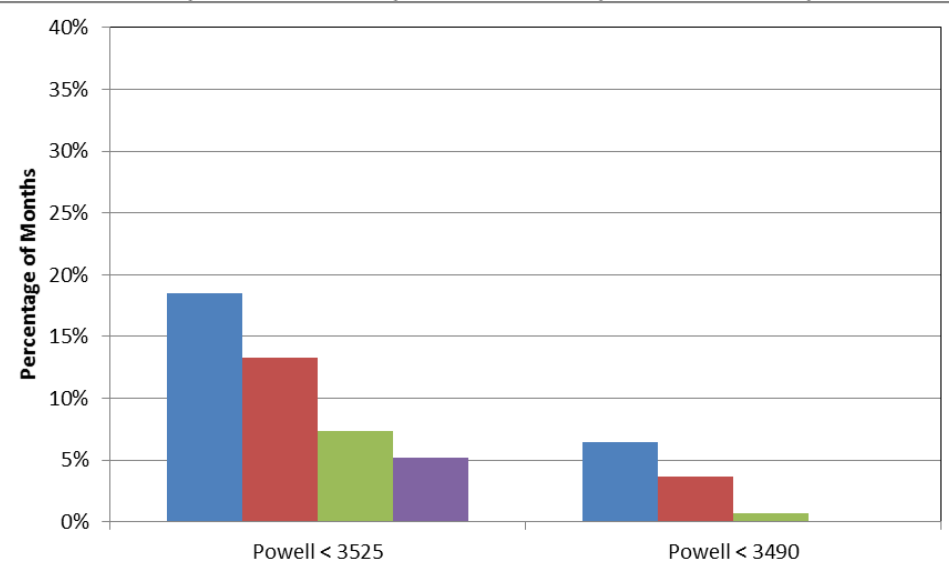
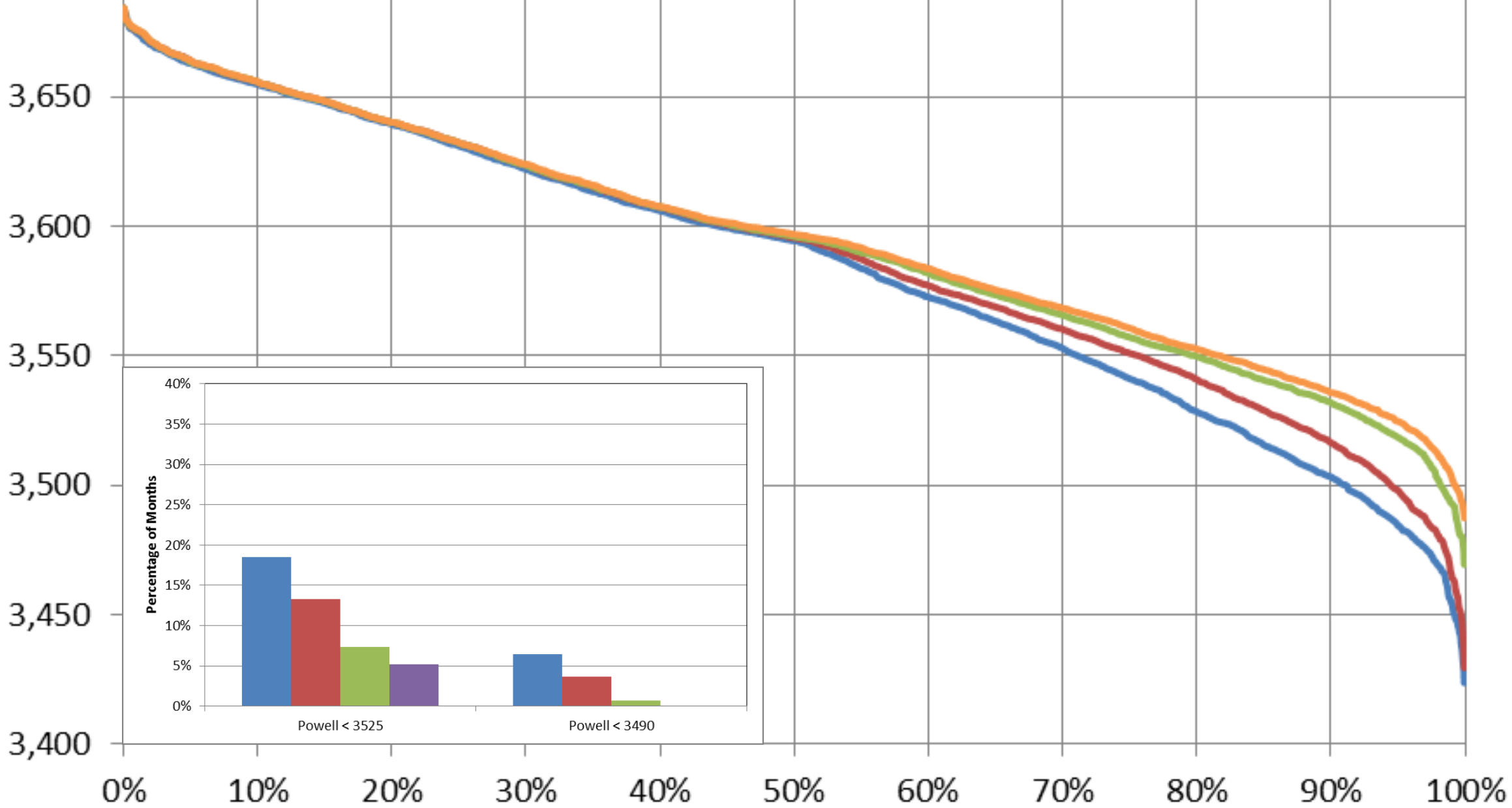
- SETS THE “SHORTAGE” LEVELS FROM L. MEAD
- INTEGRATES THE OPERATION OF MEAD AND POWELL
- SETS THE ANNUAL RELEASE LEVELS FROM LAKE POWELL
- PROVIDES FOR “ICS” IN L. MEAD
- EXPIRES AFTER WY 2026

Lake Powell Operational Tiers (subject to April adjustments or mid-year review modifications)		
Lake Powell Elevation (feet)	Lake Powell Operational Tier	Lake Powell Active Storage (maf)
3,700	Equalization Tier equalize, avoid spills or release 8.23 maf	24.32
3,636 – 3,666 (see table below)	----- Upper Elevation Balancing Tier release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.54 – 19.29 (2008 – 2026)
3,575	----- Mid-Elevation Release Tier release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.52
3,525	----- Lower Elevation Balancing Tier balance contents with a min/max release of 7.0 and 9.5 maf	5.93
3,370		0

DROUGHT CONTINGENCY PLANNING

- Objectives:
 - (Upper Basin) Identify actions that can reduce the risk of either losing power production at Powell or lose ability to meet our compact obligations
 - **Why 3525'? Maintains power production, and by always keeping some water in Powell, we avoid a compact "hole" where we can't deliver minimum required amount downstream (hydraulics).**
- Possible Solutions:
 - Drought Operation of CRSP reservoirs (Upper Basin)
 - **Demand Management** (Lower Basin and Upper Basin)
 - Continue Augmentation (Cloud Seeding) Activities (Upper Basin only)
- Best solutions involve a coordinated effort between basins, because Powell and Mead operations are closely linked through the 2007 Interim Guidelines
- Lower Basin has proposed a plan whereby they begin additional conservation measures at Mead El. 1090', with as much as 1.2MAF conservation as Mead approaches El. 1020'

Powell Pool Elevation (ft)



Modeled Frequency of Exceedence

Baseline

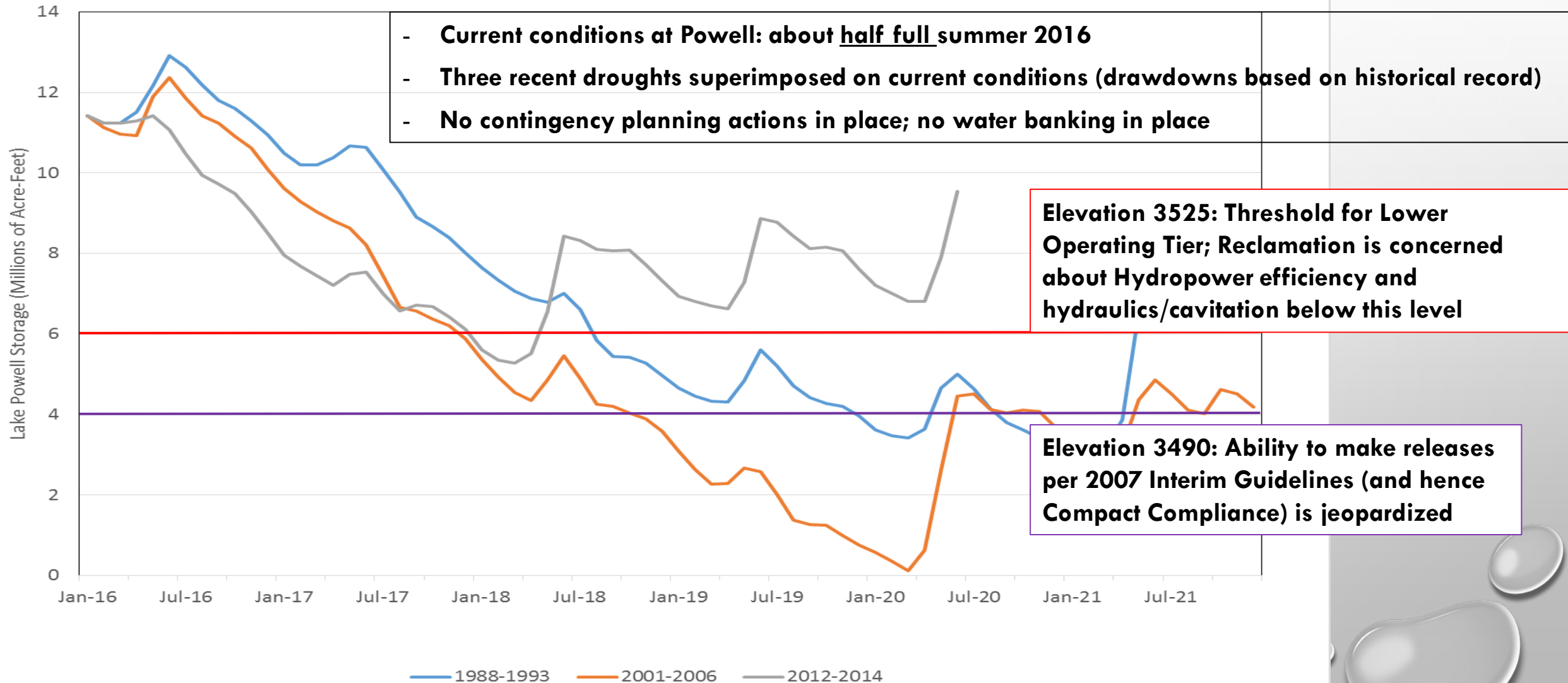
LB DCP with Recovery

BACKGROUND AND CATALYST FOR WS STUDY

- Dec 2014 Joint West Slope BRT Meeting, Request was made for additional studies.
- Colorado's Water Plan: Take actions that will minimize risk of compact curtailment actions (pt. 4 of Seven Point Framework)
- Many questions were being asked concerning the connection between the SCA pilot projects, the water bank work group, the Colorado Water Plan, contingency planning and talk of new TMDs

WHAT IF DROUGHT PERIODS OF PAST 25 YRS REPEATS?

Recent Droughts - Powell Drawdowns



WEST SLOPE BASIN ROUNDTABLE STUDY

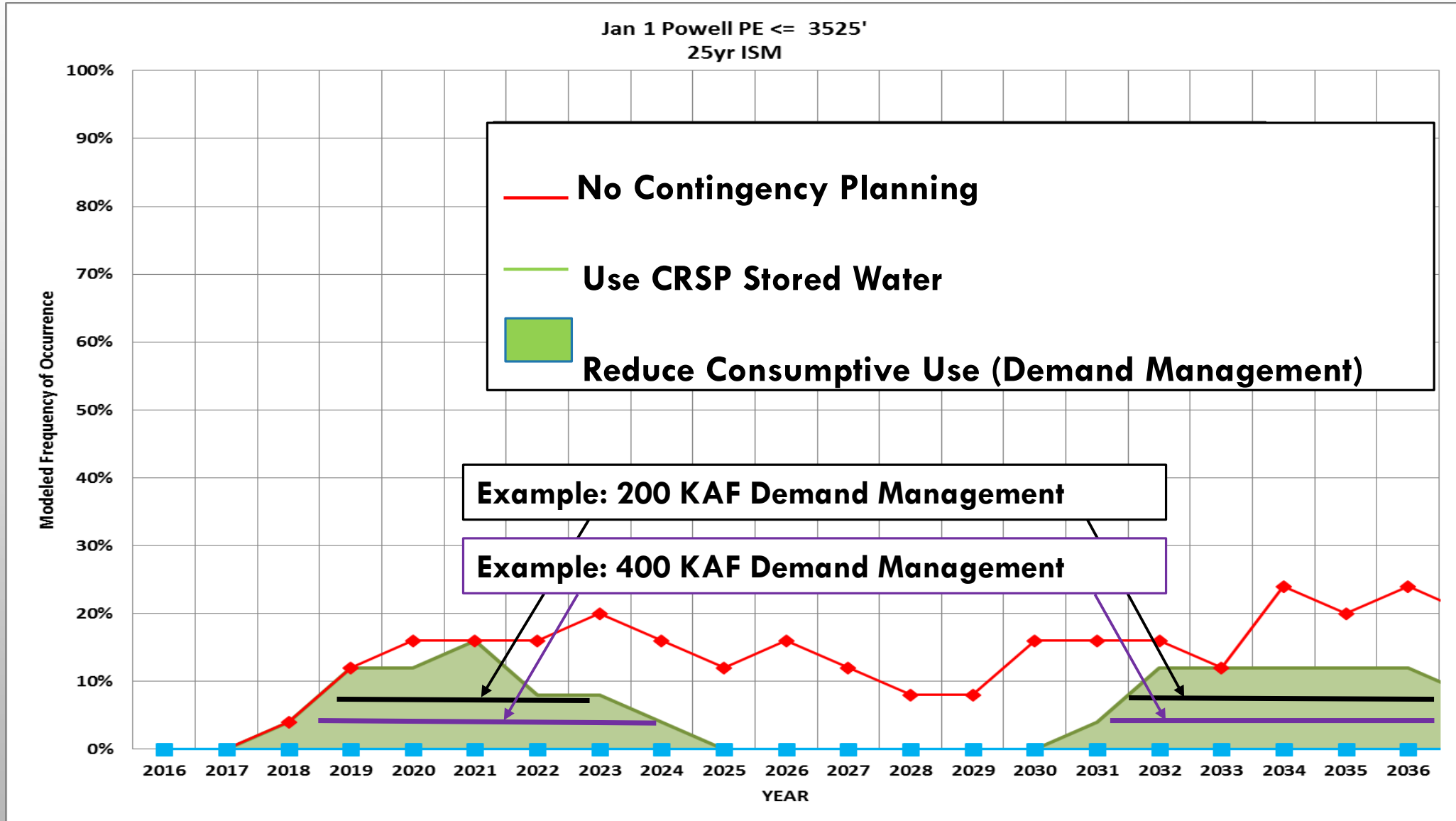
PHASE I

Questions to answer:

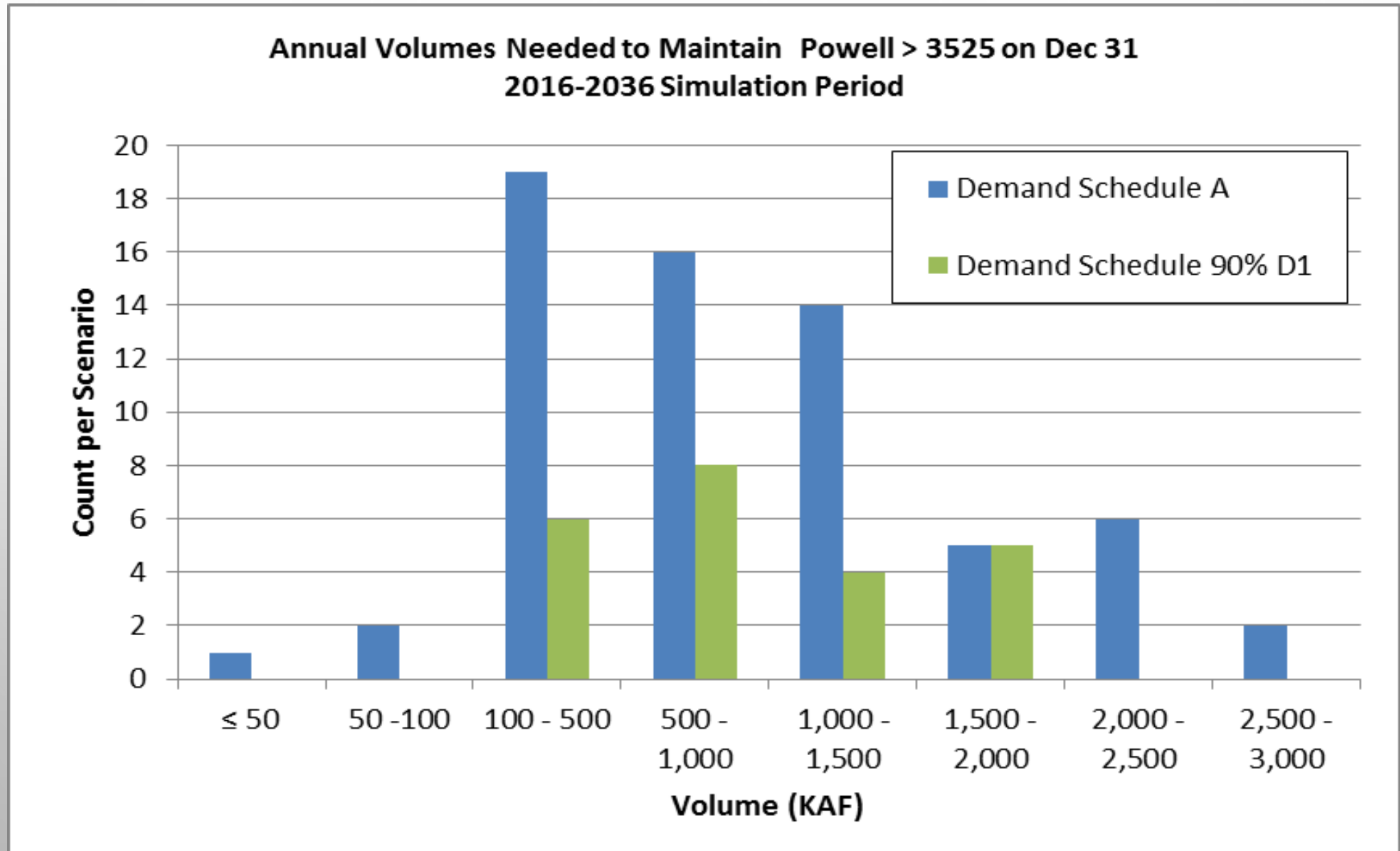
- 1. What are magnitude and duration of Powell shortages below elevation 3525'?**
- 2. How much of the above shortages can be met by contributions from Drought Operations of CRSP reservoirs? (A: up to about 2 MAF)**
- 3. How much consumptive use reduction (“demand management”) would be needed by Upper Basin states - AFTER use of stored CRSP water - in order to maintain Powell pool elevations?**
- 4. What are possible implications to Compact deliveries? What is range of volumes that Colorado might need to conserve? At a minimum 51.75% of total (Colorado’s apportionment under the 1948 Upper Basin Compact is 51.75%, but we’re currently using about 56-58% of UB total)**

Use CRSS Model to address these “What If” questions. We must understand the “Big River” issues in order to address issues within Colorado.

COLORADO & BRTS NEED TO UNDERSTAND THE RISK AND EVALUATE TRADE-OFFS BETWEEN DEMAND MANAGEMENT COST AND ELIMINATING ALL RISK



WHAT WOULD IT TAKE TO COMPLETELY ELIMINATE RISK?



CONCLUSIONS

- **Hydrology, Demands and Future Development levels matter, the higher the consumptive use in the UB the higher the risk to all users.**
- **Contingency Planning is Essential, CRSP reservoir drought operations reduces the risk, but in more severe droughts (e.g., 1988-1993 & 2001-2005), demand management is also required**
- **Some of the demand management volumes we are seeing in the model are very large and may not be feasible, so we need to consider the “trade-offs” and alternative strategies**
- **Example: Demand Management Combined with a Water Bank:**
 - **Could limit the Annual impact to CU by spreading Conservation over many years**
 - **Would provide greater control over conserved water**

WATER BANK WORK GROUP

- **IMPLEMENTATION OF A WATER BANK IS ONE, BUT NOT THE ONLY TOOL, FOR DEMAND MANAGEMENT – IS WATER BANKING FEASIBLE FROM THE TECHNICAL, ADMINISTRATIVE, ECONOMIC & POLITICAL PERSPECTIVES**
- **WATER BANKING IS HAPPENING IN THE LB, BUT CONDITIONS ARE VERY DIFFERENT**
- **NEED TO INTEGRATE THE CONTINGENCY PLANNING, RISK STUDY & WATER BANK EFFORTS**
- **STILL MANY-MANY UNANSWERED QUESTIONS**

TAKE-HOME MESSAGES

- **AS LONG AS THE UB HAS WATER STORED IN LAKE POWELL, THERE IS LITTLE TO NO RISK OF A COMPACT DEFICIT**
- **CONTINGENCY PLANNING IS ESSENTIAL, DROUGHT OPERATIONS OF CRSP RESERVOIRS SIGNIFICANTLY REDUCES THE RISK TO THE UB**
- **AT TODAY'S LEVEL OF DEVELOPMENT, DEMAND MANAGEMENT IS NEEDED AND FURTHER REDUCES THE RISK TO THE UB**
- **FOR SEVERE DROUGHTS, 2000-2005 OR 1953-56, NEEDED CUTBACKS FOR DM ARE VERY LARGE – SO ALTERNATIVE STRATEGIES ARE NEEDED & SOME RISK MAY BE UNAVOIDABLE**
- **CONTINUE STUDY EFFORT – THEN GET TO THE FRAMEWORK DISCUSSIONS!!**

END